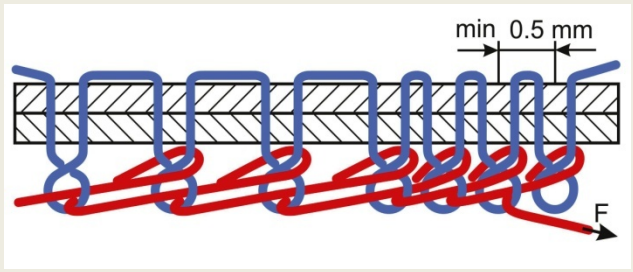
Mr. Zarif Sharifovich Tadjibaev, mechanical engineer, PhD, Director of ZARIF Sewing Machine Co., Ltd., who in 2020 invented the new ZARIF technology of forming a double thread chain stitch using a rotary looper, which in the 21st century made a breakthrough in sewing various materials using a single-line thread seam, answers the questions of Ms.Paulami Chatterjee from Fibre2Fashion Pvt. Ltd.

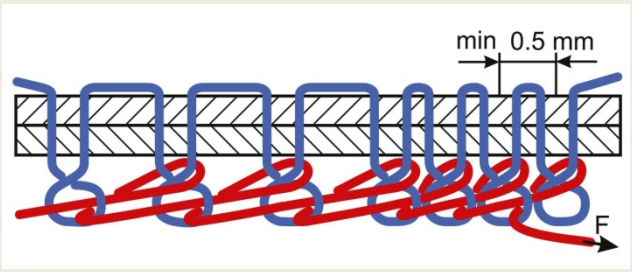
January, 2021.

A prototype of the new ZARIF double thread chain stitch sewing machine from 2020, which operates on the basis of the new ZARIF double thread chain stitch technology from 2020.

The beginning of the frame of the 59-minute video «In the 21st century a BREAKTHROUGH in sewing with the new ZARIF doublechain sewing machine from 2020» (watch the video: https://youtu.be/8yowg9gteBU)



Normal new type 401 double thread chain stitch for tight joints of materials.



Elastic new type 401 double thread chain stitch for sewing light and ultra-light materials with a smooth seam and for sewing elastic materials with an elastic seam.

Question No. 1:

How did you come up with the new Zarif double thread chain stitch technology? What was the time invested behind this research?

Answer No. 1:

Thank you for your question, probably many people are very interested in how I came up with the idea of forming a double thread chain stitch using a rotary looper.

As you know, thread stitches are divided into two large groups, such as lockstitches and chain stitches, and they in turn are divided into many types of lockstitches and chain stitches.

And accordingly, sewing machines, depending on the type of stitch, are divided into lockstitch sewing machines and chain stitch sewing machines.

Currently, all modern sewing machines, both lockstitch and chain stitch, use technologies for forming various types of stitches, which are based on the principle of forming the lockstitch and chain stitch, which were invented in the 19th century.

These existing technologies of forming lockstitch and chain stitch have quite a lot of disadvantages related to the structure of the stitch and the technologies of forming these stitches, therefore, any improvement of these technologies of forming the stitch produced in the future cannot solve these problems.

Such disadvantages of these existing stitch forming technologies include the complex mechanical design of sewing machines, stitch skipping, thread breakage, needle breakage, the need to adjust the threads tension when changing the thickness and stiffness of the sewn materials, etc.

To develop and produce a sewing machine that does not have the above and other disadvantages, it is possible only by inventing a new technology for forming a thread stitch.

However, the task of inventing a new thread stitch technology is very difficult to solve and this is confirmed by the fact that modern sewing machines still use technologies for forming thread stitches, invented in the 19th century.

Inventing a new thread stitch forming technology becomes even more difficult because it should not have most of the disadvantages of existing thread stitch forming technologies.

Despite this, I still managed to invent in 1994, a ZARIF technology for forming a double thread chain stitch using a rotary looper, for which US Patent No. 6095069 was issued in 2000 (see https://www.google.com/patents/US6095069).

For the first time in the world, ZARIF double thread chain stitch technology from 1994 allowed the development of a double thread chain stitch sewing machine with a very simple mechanical design.

As you know, the simplicity of the mechanical design of any machine, including a sewing machine, will reduce the cost of manufacturing and positively affect the reliability of the machine.

In addition, I was very interested in how in practice will work my ZARIF double thread chain stitch technology from 1994, can I get quality stitches when sewing at speeds of 5000 rpm, would it be possible to sew without skipping stitch, without thread breakage and without breakage of the needle and also possible to sew various materials without adjustment of normal tension of threads, and to what thickness of materials you can sew?

I can get answers to these questions of mine only after making a prototype of a double thread chain stitch sewing machine, working on the basis of my ZARIF double thread chain stitch technology from 1994.

And in 1997 I started to implement this Project of mine.

Since there is not a single Company engaged in the production of sewing machines in Uzbekistan, it is almost impossible to manufacture a sewing machine from start to finish, in addition, it requires a lot of time and a lot of financial expenses.

In this regard, I decided to make a prototype sewing machine by reconstructing the designs of existing lockstitch sewing machines, in order to significantly reduce the machine's production time and reduce the financial cost of manufacturing.

I decided to make a prototype of a double thread chain stitch sewing machine with a flat platform and bottom feed of material, i.e. a type of sewing machine that is very widely used in garment factories for making clothes.

At that time, in Uzbekistan, sewing factories very widely used lockstitch sewing machines with a flat platform and bottom feed of material of class 97-A for sewing light materials with a needle bar stroke of 29 mm and class 1022 for sewing medium materials with a needle bar stroke of 32 mm of the Company «Orsha» (Belarus).

I chose a class 1022 lockstitch sewing machine to make a prototype double thread chain stitch sewing machine, because I wanted the sewing machine to be able to sew thick materials.

Then I started thinking about how to fit my ZARIF double thread chain stitch technology from 1994 into the design of the class 1022 lockstitch sewing machine instead of the lockstitch technology.

After much research, I was able to find a technical solution for placing my ZARIF sewing technology into the mechanical design of a class 1022 lockstitch sewing machine.

And, in 1997, I manufactured the world's first prototype ZARIF double thread chain stitch sewing machine, which uses a rotary looper.

After that, I began to practically study my ZARIF double thread chain stitch technology from 1994 by conducting various experiments using a prototype ZARIF double thread chain stitch sewing machine.

My experiments on a prototype ZARIF sewing machine allowed me to discover some shortcomings of my ZARIF double thread chain stitch technology from 1994 in the process of sewing various materials at speeds up to 5000 rpm.

After that, starting in 1997, I began to conduct research and experimental work, with the aim of inventing the most advanced technology for forming a double thread chain stitch, by improving my ZARIF double thread chain stitch technology from 1994.

As a result of my research and experiments from 1997 to 2020, I managed to find quite a lot of know-how that allowed me to gradually improve my ZARIF double thread chain stitch technology from 1994 three times in 2016, 2019 and 2020.

After each improvement of my ZARIF double thread chain stitch technology from 1997, I shot a video film to practically demonstrate them and they are all available for viewing on my YouTube channel (see https://www.youtube.com/user/ZARIF1961).

It should be noted that none of my videos reveal the know-how of my ZARIF sewing technology, all of them only demonstrate the technological and technical capabilities of my ZARIF sewing technology.

The new ZARIF double thread chain stitch technology, which I invented in 2020, completes the improvements of my ZARIF double thread chain stitch technology from 1994, as it is the most advanced in the world for sewing with a single-line thread seam.

Therefore, I shot my last 59 minute video showcasing my new ZARIF double thread chain stitch technology from 2020, titled «In the 21st century a BREAKTHROUGH in sewing with the new ZARIF doublechain sewing machine from 2020» (see https://youtu.be/8yowg9gteBU).

Question No. 2:

What was the seed money with which you started the company? Where does the company stand today in terms of revenue and sewing machine technology?

Answer No. 2:

After graduating with honors from the Tashkent Institute of Textile and Light Industry with a degree in mechanical engineering for machines and apparatuses of Light Industry, from 1984 to 1987 I worked as an engineer from the beginning in the Central Asian Commissioning Department of textile machines, and then in the Tashkent factory for the production of textile machines.

Since 1987, I moved to the Tashkent Institute of Textile and Light Industry, from the beginning I worked as the head of the laboratory of the Department «Machine Parts», then as a teacher, from 1992 to 1994 I studied in graduate school and in 2001 I defended my PhD thesis on my ZARIF technology of forming a double thread chain stitch using a rotary looper from 1994.

In 2012, I retired from the Tashkent Institute of Textile and Light Industry and founded my company «ZARIF Sewing Machine Co., Ltd.» at my own expense.

My Company is small and is a Technology Company and is mainly engaged in improving my ZARIF double thread chain stitch technology from 1994 and commercializing it to the Industry, more information is available on the Website: https://zarif.uz .

My Company also sells IT products, equipments, and accessories for the Light Industry of Uzbekistan, more detailed information is available on the Website: https://zarif.gl.uz.

The profitability of my Company is small and therefore it is not able to independently introduce into the industry my new ZARIF double thread chain stitch technology from 2020, which in the 21st century made a breakthrough in sewing with a single-line thread seam.

Therefore, I am currently looking for Companies among manufacturers of industrial sewing machines and automated sewing systems that are interested in becoming my Partner on mutually beneficial terms in the commercialization of my new ZARIF double thread chain stitch technology from 2020.

Question No. 3:

Who are your major customers worldwide?

Answer No. 3:

My 59-minute video practically proved the workability of my new ZARIF double thread chain stitch technology from 2020, while moving the material in only one direction along the needle plate slot, , with the help of my prototype ZARIF double thread chain stitch sewing machine with a flat platform and with bottom feed of material.

Now, it is possible to start the development and mass production of industrial samples of various industrial sewing machines with different types of material feed and platform shape, automated sewing systems and automatic pattern sewing machines with a 360-degree rotating head, where the material feed occurs only in one direction, working on the basis of my new ZARIF double thread chain stitch technology from 2020.

After the start of production of these various new industrial sewing machines, automated sewing systems and automatic pattern sewing machines with 360 degree rotating head, can be widely used in the production of clothing, home textiles, shoes, sneakers, upholstered furniture, car seats, car covers, airbags, soft toys, sleeping bags, tents, bags, backpacks, etc.

This was made possible by the fact that my new ZARIF double thread chain stitch technology from 2020 for the first time in the world allows you to tightly join any materials with a double thread chain stitch and qualitatively join multi-layer materials, where there are combinations of different materials in terms of stiffness, such as textile-leather, textile-plastic, knitwear-leather, knitwear-plastic.

In addition, my new ZARIF double thread chain stitch technology from 2020 is the most versatile in the world, as it is able to qualitatively join any materials up to 9 mm thick with a small needle bar stroke of 32 mm, without changing the normal tension of the threads, which is impossible to achieve with existing stitch forming technologies.

At the same time, my new ZARIF double thread chain stitch technology from 2020 has the know-how with which you can adjust the degree of tightening of the top thread loop in the stitch, without changing the normal tension of the threads.

In this regard, if you strongly tighten the loop of the top thread in the stitch, you get a normal stitch, which is used for tight join of materials, and if you slightly tighten the loop of the top thread in the stitch, you can get an elastic stitch, which is used to get a smooth seam on light and ultra light materials and to get an elastic seam on elastic materials.

In addition, my new ZARIF double thread chain stitch technology from 2020 for the first time in the world was able to guarantee sewing without breaking threads, without breaking the needle and without deforming the needle tip, which allows automated sewing systems and automatic pattern sewing machines with a 360-degree rotating head to perform technological sewing operations without an emergency stop.

Also, my new ZARIF double thread chain stitch technology from 2020 was the first in the world to guarantee sewing without stitch skipping and securely tack the end of the chain seam by condensation stitches, reducing the last few stitches to 0.5mm, which is very important for all chain stitch forming technologies, as all chain seams unravel very easily from the skipped stitch towards the beginning of the seam and from the end of the seam.

All of the above listed advantages of my new ZARIF double thread chain stitch technology from 2020, significantly expand the scope of a double thread chain stitch type 401 by replacement of a lockstitch of type 301, which allows its use in the production of the aforementioned various sewing products.

Since, single-line thread seams are very widely used in the production of various sewing products than other types of thread seams, the future customers of our various industrial sewing machines, automated sewing systems and automatic pattern sewing machines with 360 degree rotating head, working on the basis of my new ZARIF double thread chain stitch technology from 2020, can be all small and large Companies and sole proprietors who are engaged in the production of various sewing products.

Question No. 4:

What are the problems with automated sewing in general?

Answer No. 4:

As you know, the automation of the production of many products, including the automation of the production of various sewing products, is currently taking place at a very high rate.

Currently, there are fully automated lines for the production of simple sewing products, such as medical masks, home textile products, mats, T-shirts and so on.

However, currently there are no fully automated lines for the production of complex sewing products, due to the presence of many complex technological sewing operations, which are very difficult to fully automate.

But at the same time, the number of garment factories is currently increasing, where the sewing of various sewing products mainly uses various automated sewing systems and automatic pattern sewing machines instead of conventional industrial sewing machines.

In such garment factories, not only productivity increases and the quality of products is improved, but also the problem of finding highly qualified sewing operators is solved, since it is possible to quickly teach anyone with a secondary education to work on automated sewing systems and automatic pattern sewing machines.

No doubt, in the future, the number of such garment factories will grow and grow, so, at present, very many Companies that were previously engaged in the production of various industrial sewing machines also began to produce various automated sewing systems and automatic pattern sewing machines.

As you know, the main requirements for performing sewing in automatic mode are the continuity of technological sewing operations without an emergency stop due to thread breakage, stitch skipping, needle breakage and needle tip deformation.

It is known that all existing stitch forming technologies are not able to meet these requirements with a 100% guarantee, which means that it is impossible to produce automated sewing systems and automatic pattern sewing machines that can fully meet all the requirements of sewing automation.

My new ZARIF double thread chain stitch technology from 2020 opens a new era in sewing automation, as, in the world, only it is able to fully meet all the requirements of sewing automation.

Question No. 5:

What are the problems associated with lockstitch type 301 and double thread chain stitch type 401, which your new technology is going to address?

Answer No. 5:

As you know, at present, for joining materials with a single-line thread seam, a lockstitch of type 301 and a double thread chain stitch of type 401 are mainly used.

The principle of forming a lockstitch of type 301 is based on passing one branch of the bottom thread through the loop of the top thread and ensuring that the threads are intertwined in the middle of the sewn material.

This principle of stitch formation can only be carried out by means of hooks (shuttles) that perform rotational or oscillatory or reciprocating movements, having a point to catches the loop of the top thread formed by the needle and inside which there must be a bobbin on which the bottom thread is wound, which is fed under a certain tension.

The principle of forming a double thread chain stitch of type 401 based on the passing loop of thread through another loop of thread, that is, the loop of the bottom thread is passed through the loop of the top thread, and then the loop of the top thread is passed through the loop of the bottom thread, and ensuring that the threads are intertwined on the underside of the sewn material.

In the existing technologies of forming a double thread chain stitch type 401, invented in the 19th century, this principle of formation of a stitch is performed by means of loopers that have a point to catches the loop of the top thread formed by the needle and the eye near the point, through which the bottom thread is passing, which make complex spatial movement or oscillatory movement along the seam line, working together with spreader thread or oscillatory movement in a horizontal plane.

It is known that the lockstitch of type 301 and the double thread chain stitch of type 401 have the following advantages and disadvantages.

The advantages of the lockstitch are: a relatively small consumption of threads per stitch; the upper and lower sides of the stitch has the same form, similar to a dotted line; stitch on the surfaces of the material does not create thickening, which makes it more resistant to wear; the seam is of the lockstitch is not unraveling.

The disadvantages of lockstitch are: the need for accurate adjustment of the yarn tension, so that they were intertwined in the middle of the sewn material; the stitching is not suitable for the join of elastic materials, since it has little stretch; the strength of the lockstitch is lower than the strength of the double thread chain stitch in the transverse direction.

The advantages of a double thread chain stitch are: the stitch is more elastic than the lockstitch; the bottom thread does not pass through the material; the stitch in the transverse direction is more strength than the lockstitch, since two branches of the bottom thread pass through the loop of the top thread.

The disadvantages of a double thread chain stitch are: a relatively high consumption of threads per stitch than the lockstitch; the stitch on the bottom surface of the material creates thickening, as threads intertwine on the lower surface of the material, which reduces the resistance of the lower side stitch to wear; the seam from the stitch is easily unravel from the end of the seam and from the place of skipping the stitch towards the beginning of the seam, therefore, the technology of forming a double thread chain stitch should provide a reliable tacking of the end of the seam and sew without skipping the stitch.

As you know, in any technology of forming a thread stitch, the following processes should occur: holding the top thread through the material with a needle and forming a loop-overlap from the top thread when lifting the needle from the lowest position; interweaving the threads of stitch; feed the material to the length of the stitch; tightening the threads of the stitch.

At the same time, the technologies for forming various types of stitches mainly differ in the method of interweaving the threads of the stitch and the method of tightening the threads of the stitch.

In the technology of forming the lockstitch to intertwined the threads used the hook (shuttle), which point captures the loop-overlap of the top thread formed by the needle when lifting it from the extreme lower position, then the hook extends the loop of the top thread and stitch it around the bobbin case with the bottom thread, the result is the bottom thread will be inside the loop of the top thread, that is, the principle of forming a lockstitch is implemented.

Feeding and tightening of the top thread is performed using a thread take-up, while the bottom thread is fed with a tension created by a plate spring fixed to the surface of the bobbin case.

It should be noted that all technologies of forming a lockstitch of type 301, regardless of the design and type of movement of the hook (shuttle), have the same disadvantages, which are quite a lot.

Therefore, I will list the disadvantages of forming a lockstitch of type 301 that are missing in my new ZARIF double thread chain stitch technology from 2020.

The first drawback is the need for frequent changer of the bobbin with the bottom thread located inside the hook (shuttle), due to the small size of the bobbin.

The second drawback is that all types of hooks (shuttles) are complex in design and consist of many parts and are relatively expensive.

The third disadvantage is the presence of rubbing surfaces in all types of hooks (shuttles), because of this, the hooks must be lubricated, the service life of the hooks is reduced and it is necessary to clean the hooks from dirt, and when a piece of thread enters between the rubbing surfaces, a sudden braking of the sewing machine can occur.

The fourth drawback is the need to adjust the threads tension when sewing different materials, even when the top and bottom threads are intertwined in the middle of the sewn material.

This is because if the threads have a large tension, the seam may pucker, or break easily when stretched, and if the threads have a weak tension, the seam will gap when pressed open, exposing the threads between the materials.

Therefore, using the technology of forming a lockstitch, it is impossible to achieve high-quality sewing of various materials without adjusting the normal tension of the threads.

The fifth drawback is that with increasing sewing speed, the loss of mechanical strength of the top thread increases during the sewing process.

This is because the hooks (shuttles) consume a large length of top thread, and the consumption of top thread per stitch is relatively small, resulting in the top thread passes through the eye of the needle and the material many times before it finally gets taken up in the material.

The sixth drawback is the uneven tightening of the top thread with the help of a thread take-up lever.

This is because when forming a lockstitch, the hook (shuttle) consumes a large length of the top thread loop, so the thread take-up lever is forced to quickly reduce and tighten the top thread loop before the needle makes the next puncture of the material.

Therefore, it is technically impossible to make a uniform and smooth reduction, tightening the loop of the top thread.

The seventh drawback is that the maximum allowable gap between the point of the hook (shuttle) and the body of the needle is 0.1 mm, because of this, when changing from needle No. 130/21 to needle No. 60/8, it is necessary to adjust the hook relative to the needle.

The eighth drawback is that to increase the reliability of the grip of the hook point loop-overlap of the top thread, it is necessary to adjust the height of the needle rise from the lowest position depending on the thickness, stiffness and elasticity of the materials to be sewn, and also to use the needle guards.

The eighth drawback is the inability to sew various materials with a thickness of up to 9 mm with a small needle bar stroke of 32 mm, since for sewing heavy materials with a thickness of up to 9 mm, it is necessary to increase the needle bar stroke.

The ninth drawback is the inability to perform with a 100% guarantee of the process of entering the point of hook into the loop-overlap of the top thread, which forms the needle, when lifting from the lowest position.

Therefore, lockstitch forming technologies are not able to guarantee sewing without skipping a stitch.

The tenth drawback is that in the technology of forming a lockstitch, there are factors that can lead to the breakage of threads, especially the top thread.

Therefore, the technologies of forming a lockstitch are not able to guarantee sewing without breaking the threads.

The eleventh disadvantage is that the needle when moving down passes a short distance from the wall of the needle plate opening and from the hook (shuttle) bodies and, therefore, the deflection of the needle can lead to a collision of the needle with the needle plate and the hook (shuttle) body.

Therefore, the technologies of forming a lockstitch are not able to guarantee sewing without breaking the needle and deforming the needle tip.

Of course, the technology of forming a lockstitch in addition to the advantages of the lockstitch type 301, there are the following advantages.

In the technology of forming a lockstitch, a standard needle with one long groove is used, since the needle does not participate in pre-tightening the loop of the top thread located in the previous stitch, as it happens in all existing technologies of forming chain stitches.

In addition, the technology of forming a lockstitch by adjusting the tension of the threads can ensure a tight join of materials and qualitatively sew combinations of various materials, such as textile-leather, knitwear-leather, textile-plastic, knitwear-plastic, etc.

Therefore, at present, only a lockstitch of type 301 is used for this purpose, since it is impossible to achieve this with the help of existing technologies for forming a double thread chain stitch of type 401, where the looper carries the bottom thread.

Practical proof is that in the world it is impossible to find a denim trouser, where the side long seam made with a double thread chain stitch type 401 provided a tight join of denim materials.

It is also impossible to find a sewing product where a double thread chain stitch type 401 stitched through plastic zippers, connected leather materials to textile and knitted materials.

By improving these existing technologies for forming a double thread chain stitch of type 401, where the looper carries the bottom thread, it is impossible to achieve this.

My confidence is based on the fact that using any technology of forming double thread chain stitch type 401, where the looper carries the bottom thread, it is impossible to implement strong tightening of the top thread of stitch and therefore, it is impossible to obtain a tight join of materials.

It should be noted that for a tight join of materials with a lockstitch of type 301, the threads must be intertwined in the middle of the sewn material, and the top thread and the bottom thread must be strongly tightened.

A, for a tight join of materials with a double thread chain stitch of type 401, it is enough to tighten only the top thread strongly, since the threads are intertwined on the lower surface of the material and through the loop of the top thread passes two branches of the bottom thread.

However, with the help of existing technologies for forming a double thread chain stitch of type 401, it is impossible to make a strong tightening of the loop of the top thread of the stitch.

This is due to the principle of forming a double thread chain stitch of type 401 using a looper carrying the bottom thread, as well as the process of feeding and tightening the threads.

First, the point of the looper carrying the bottom thread enters the loop-overlap of the top thread, which is formed by the needle, i.e. there is an input of the loop the bottom thread in a loop of the top thread.

Not performing this process will result in skipping a stitch.

To increase the reliability of this process, movable and fixed needle guards are used, as well as the maximum allowable gap between the looper point and the needle should not exceed 0.15 mm.

Then the needle comes out of the material and the material is feed to the length of the stitch and the needle with the top thread will make the next puncture of the material and begin to hold the top thread through the material.

Now, it is necessary to ensure that the loop of the top thread enters the loop of the bottom thread, this is ensured by the formation of a thread triangle, which consists of: a branch of the bottom thread; loop of the top thread worn on the body of the looper; the looper body.

In existing technologies of forming a double thread chain stitch, a thread triangle can be formed with the help of a looper performing a complex spatial movement or an oscillatory movement along the seam line, working together with spreader thread or oscillatory movement in a horizontal plane.

If the needle with the top thread does not pass through the area of the thread triangle, then the stitch is skipped.

At the same time, reducing the length of the stitch leads to a decrease in the area of the thread triangle, therefore, the minimum stitch length is limited to 1 mm, since, with a stitch length less than 1 mm, the probability of not passing the needle through the area of the thread triangle increases, which will lead to skipping the stitch.

After passing the needle with the top thread through the area of the thread triangle, the looper returns back and drops the loop of the top thread from its body, and as a result, the loop of the top thread enters the loop of the bottom thread.

Now you need to tighten the loop of the top thread, which is located in the previous stitch, and how can this be done?

It is impossible to tighten the loop of the top thread with a thread take-up, since the loop of the top thread is in the previous stitch and the needle with the top thread is immersed in the material.

Only with the help of a needle can you pre-tighten the loop of the top thread, which is in the previous stitch, since, after dropping the loop of the top thread from the body of the looper, the needle will continue to move down to the most extreme position, consuming the top thread.

As is known, the consumption of the top thread by the needle begins from the moment of immersion in the material of the needle eye and ends in the lowest position of the needle.

If you measure the distance between the needle ears when the needle eye is immersed in the material and when the needle is in the lowest position and multiply this distance by two, you get the length of the top thread consumed by the needle.

Thread take-up lever top thread takes such a length of top thread to the needle, which needle is enough, until reset loop of the top thread from the looper, and then the needle is continuing to move down, beginning to consume the top thread through the reduction of the size of the loop of the top thread in the previous stitch.

When performing this process, the top thread moves over the surface of the needle and the top thread experiences pressure from the material, which creates resistance to the movement of the top thread over the surface of the needle.

To reduce this resistance, a second long groove is made on the needle.

It is known that the longitudinal bending strength of such a special needle with two long grooves is lower than that of a standard needle with one long groove.

As the size of the top thread loop is reduced by the needle, a bottom thread loop begins to form on the needle body from the bottom thread.

Then, when the needle is raised from the lowest position, a loop-overlap is formed from the top thread, into which the point of the looper enters.

The final tightening of the loop of the top thread is carried out during the feed of the material to the length of the stitch with the help of a looper, on the body of which the next loop of the top thread is located.

With this method of tightening the loop of the top thread, i.e. first pre-tightening the loop of the top thread with a needle, then the final tightening of the loop of the top thread with a looper while feed the material to the length of the stitch, it is not possible to tighten the loop of the top thread much, therefore, such a stitch cannot tightly join the materials.

As I mentioned above, with the help of existing technologies for forming a double thread chain stitch, where the looper carries the bottom thread, it is impossible to get a high-quality seam when joining textile and knitted materials with hard materials such as leather and plastic.

This is because by increasing the rigidity of the sewn material, dramatically increasing the material's resistance to movement of the top thread, which cannot be reduced, the result is the needle will not be able to do a preliminary tightening of the loop of the top thread, as is, begins to consume the top thread from a large spool, through the tension device where resistance is lower.

Therefore, the most basic disadvantage of the technologies of forming a double thread chain stitch, where the looper carries the bottom thread, is the participation of the needle in the preliminary tightening of the loop of the top thread located in the previous stitch.

In addition, this technology of forming a stitch cannot guarantee sewing without breaking the needle and deforming the needle tip, since the needle when moving down passes very close to the body of the looper, and therefore, when bending the needle, the needle may collide with the looper.

Also, this technology of forming a stitch is not able to guarantee sewing without skipping a stitch and without breaking threads.

Thus, the existing technologies of forming a double thread chain stitch of type 401, where the looper carries the bottom thread, have the following disadvantages, which are absent in my new ZARIF double thread chain stitch technology from 2020:

1. It does not allow you to tightly joint materials using a double thread chain stitch type 401.

2. It does not allow high-quality join textile and knitted materials with leather and plastic materials using a double thread chain stitch of type 401.

3. It is necessary to use a special needle with two long grooves.

4. The maximum allowable gap between the point of the looper and the needle is 0.15 mm, as a result, to switch from needle No. 130/21 to needle No. 60/8, it is necessary to adjust the looper relative to the needle.

5. To increase the stability of stitch formation, it is necessary to use movable and fixed needle guards.

6. Loopers that carry the bottom thread have a complex mechanism.

7. It does not allow reducing the length of a double thread chain stitch to 0.5 mm.

8. It cannot guarantee sewing without skipping a stitch, without breaking threads, without breaking the needle and without deforming the needle tip.

Of course, the existing technology of forming a double thread chain stitch, where the looper carries the bottom thread, in addition to the advantage of the double thread chain stitch type 401, there is such an advantage as the lack of frequent changer of the bottom thread, before the technology of forming a lockstitch type 301.

It should be noted that in my 59-minute video, before demonstrating my new ZARIF double thread chain stitch technology from 2020, I very briefly showed and demonstrated the main disadvantages of existing stitch forming technologies.

Question No. 6:

What are the applications areas of your new Zarif double thread chain stitch technology from 2020?

Answer No. 6:

My new ZARIF double thread chain stitch technology from 2020 for the first time in the world allows you to significantly expand the scope of the double thread chain stitch, due to the wide replacement of the lockstitch in the production of various sewing products.

All the advantages of my new ZARIF double thread chain stitch technology from 2020 are achieved through the use of a rotary looper, a needle with one long groove, since the needle does not take part in tightening the loop of the top thread located in the previous stitch, two rotary double-disc cam thread take-ups for feeding and tightening threads, as well as through the use of quite a lot of know-how.

It is known that the rotary looper consisting of one part is the only working unit in the sewing technique that is able to circle the loops of threads around its body by turning them 180 degrees with its tail.

The rotary looper was invented by the American inventor James Edward Allen Gibbs in 1857, to form a single-thread chain stitch type 101, where the looper makes one revolution per revolution of the main shaft of the sewing machine (see Patent US17427: https://www.google.com/patents/US17427).

In 1994, I filed a Patent Application for an invention where I used a rotary looper for the first time in the world in my ZARIF double thread chain stitch technology and for which a US Patent No. 6095069 was issued in 2000 (see https://www.google.com/patents/US6095069).

Before my invention, the rotary looper was only used in single thread chain stitch sewing machines and button machines.

Since the rotary looper unfolds the loops of threads around its body, by rotating those 180 degrees, I was able to get a new type of 401 double thread chain stitch, where the loop of the top thread and the loop of the bottom thread are rotated 180 degrees.

Therefore, the underside of the new type 401 double thread chain stitch is very similar not to a chain, as in the usual type 401 double thread chain stitch, but to a thick thread laid along the seam.

In my new ZARIF double thread chain stitch technology, the needle never collides with the body of the looper when moving down, and the probability of the needle colliding with the wall of the needle plate slot is almost zero if the correct needle number is selected, corresponding to the thickness and stiffness of the material being sewn.

In addition, in my new ZARIF double thread chain stitch technology from 2020, thanks to the application of know-how:

1. High stability of stitch formation is provided without the use of needle guards.

2. High quality tightening of the stitch threads, regardless of the thickness and stiffness of the sewn materials, without changing the normal tension of the threads.

3. The maximum allowable gap between the looper point and the needle is increased to 0.5 mm, which eliminates the adjustment of the looper relative to the needle when to switch from needle 130/21 to needle No. 60/8.

4. Improved the quality of tightening threads for a stitch length of 0.5 mm.

5. The thickness of the materials to be sewn is increased to 9 mm with a needle bar stroke length of 32 mm.

6. The lifting height of the needle from the lowest position to form the loop-overlap from the top thread is the same for sewing all materials up to 9 mm thick, which allows sewing different materials without adjusting the needle bar.

7. Provides sewing without skipping a stitch.

8. Provides sewing without breaking threads.

9. A strong tightening of the loop of the top thread of the stitch is provided, which for the first time allows you to tightly join materials and qualitatively join textile and knitted materials with leather and plastic materials, using a double thread chain stitch.

10. Allows you to reduce the degree of tightening of the loop of the top thread of the stitch, without changing the normal tension of the threads, so that on light and ultra light materials you get a smooth seam and on elastic materials you get an elastic seam.

It should also be noted that in strong tightening the loop of the top thread of the stitch, along with a dense join of materials, the upper side stitch is immersed in the material and the thickness of the bottom side of stitch is reduced, leading to increased durability stitch to wear.

When replacing the type 301 lockstitch with the new type 401 double thread chain stitch with our ZARIF sewing machine, based on our new ZARIF double thread chain stitch technology from 2020, the consumer receives the following benefits:

1. One model of sewing machine with a small needle bar stroke of 32 mm for sewing all materials up to 9 mm thick.

2. Increased productivity due to the lack of frequent changer of the lower thread, thread breakage, needle breakage and deformation of the needle tip.

3. Increases the quality of the seam due to the increase in the strength and elasticity of the stitch and due to the lack of stitch skipping.

4. Allows you to easily sew various materials up to 9 mm thick without adjusting the needle bar and without adjusting the normal tension of threads.

5. Allows you too easily to switch from needle No. 130/21 to needle No. 60/8 without adjusting the looper relative to the needle.

6. Allows you to securely tacking the end of the chain seam by condensation of stitches, reducing the stitch length to 0.5 mm and using a thread chain on the edge of the material.

7. Allows you to tightly join any type of material and a combination of different materials with the new type 401 double thread chain stitch.

8. Allows you to get a smooth seam when sewing light and ultra light materials and an elastic seam when sewing elastic materials.

9. Allows to sew very long time without cleaning mud from under the needle plate, due to the fact that the looper consists of a one part and has no hole, no groove and the looper, rotating two times faster than the main shaft, the rotation creates a strong air stream which discards all mud generated from the materials and threads away from the stitch forming zone.

I am sure that the above advantages will be very interesting for all customers involved in the production of various sewing products.

Because, my new ZARIF double thread chain stitch technology from 2020, with the above advantages, turns the long-standing dream of all who are engaged in sewing into reality.

Question No. 7:

Tell us about the automatic threads trimmer technology you have invented for your new sewing machine.

Answer No. 7:

In 2016, I invented the automatic thread trimmer technology for my ZARIF double thread chain stitch forming technology and in 2020, I managed to perfect it.

Since I haven't filed a Patent Application for my technology yet, I can't go into detail about it.

I can only say that the trimming of threads is done under the needle plate and after trimming the threads, the end of the bottom thread will be clamped between the knife and the plate spring, to avoid filling the bottom thread.

Question No. 8:

Have you patented both these technologies yet? If not, when are you expecting the patents to come by?

Answer No. 8:

I have not yet filed a Patent Application for my new ZARIF double thread chain stitch technology and automatic thread trimming technology, which I invented in 2020.

I plan to file one Patent Application for these two new inventions of mine, since they are mutually related, during this 2021 year.

I also plan to patent these new inventions of mine in many countries of the world, namely in countries where there are manufacturers of sewing equipment and countries where there is a great demand for sewing equipment.

Question No. 9:

Which companies have come forward and partnered with you for the new sewing technology? Has the large-scale production begun yet?

Answer No. 9:

I currently have no partners interested in commercially implementing my new ZARIF sewing technology from 2020.

I am ready to cooperate on mutually beneficial terms with all manufacturing Companies and Investor Companies that are interested in the commercial implementation of my new ZARIF sewing technology from 2020, which may be of interest to many customers engaged in the production of various sewing products.

Question No. 10:

What would be the cost of implementing your sewing technology on machines?

Answer No. 10:

As I said above, based on my new ZARIF double thread chain stitch technology from 2020, it is possible to develop and mass-produce various industrial sewing machines, automated sewing systems and an automatic pattern sewing machines with a 360-degree rotating head, with the material moving in only one direction along the slot of the needle plate.

It should be noted that with the help of an automatic pattern sewing machine with rotating head of 360 degrees is possible to obtain any complex seam with high quality, despite the fact that the stitch formation occurs only in one direction along the slot of the needle plate, because the head and lower

part of the machine can be rotated in the range of 360 degrees in the direction coinciding with the direction of feed of the material.

Unfortunately, at present I cannot answer this question, as I do not yet have a Partner interested in the development and mass production of the above-mentioned sewing equipments, which has no analogues in the world.

Of course, the development and mass production of any type of industrial sewing machines requires significantly less financial resources and less time than the development and mass production of various automated sewing systems and automatic pattern sewing machines.

As is known, industrial lockstitch sewing machines with a flat platform and bottom feed of material are very widely used in the production of various sewing products, especially clothing.

In this regard, I want to start commercializing my new ZARIF double thread chain stitch technology from 2020 into the industry, with exactly this type of industrial sewing machine.

For this reason, I am currently looking for a Partner who is interested to cooperate with me, on mutually beneficial terms, in the development and mass production of an industrial double thread chain stitch sewing machine with flat platform and bottom feed of material with automatic functions, including automatic thread trimmer, working on the basis of my new ZARIF double thread chain stitch technology from 2020.

Question No. 11:

What future innovations in sewing automation you would be looking at?

Answer No. 11:

As I said above, it is known that in the production of various sewing products, single-line thread seams are much more used than other types of thread seams.

It is also known that in automatic pattern sewing machines, using a single-line thread seam, you can get many linear seams and any complex seams.

In addition, technologies for forming single-line thread seams are also forced to work in more extreme conditions, compared to technologies for forming other types of seams.

For example, with the help of a single-line seam, you have to sew heavy and extra heavy materials, sew through multi-layer materials, where materials can have different stiffness, sew combinations of different materials, sew through thick places of the material and through thickened seams, sew through plastic zippers.

It should be noted that, in these extreme conditions, there may be a deflection of the needle, which in the existing technologies of forming a lockstitch and a double thread chain stitch, can lead to needle breakage, to deformation of the needle tip and to skipping a stitch, which is not present in my new ZARIF double thread chain stitch technology from 2020.

In answer to your question, I believe that in the future it is impossible to achieve global innovations in the automation of sewing with a single-line thread seam, relying only on existing technologies for forming a lockstitch and a double thread chain stitch, due to their many shortcomings.

Only with the help of my new ZARIF double thread chain stitch technology from 2020 in the future can we achieve global innovations in automating sewing with a single-line seam because of its following advantages:

1. Allows you to sew without skipping a stitch, without breaking threads, without breaking the needle and without deforming the needle tip.

2. All threads are fed from a large coil, i.e. there is no frequent changer of the bottom thread.

3. Allows high-quality sewing of various materials up to 9 mm thick without adjusting the normal tension of threads with a small needle bar stroke of 32 mm.

4. For the first time, a single-long-groove needle used in lockstitch forming technology is used to form a double thread chain stitch, and it is known that a single-long-groove needle is more resistant to longitudinal bending than a two-long-groove needle.

5. Allows you to sew various materials up to 9 mm thick without adjusting the needle bar, and also allows you to easily to switch from needle No. 130/21 to needle No. 60/8 without adjusting the looper relative to the needle.

6. Allows you to tightly join any materials and a combination of any materials with a double thread chain stitch, by strongly tightening the loop of the top thread of the stitch, without adjusting the normal tension of the threads.

7. Allows you to sew light and ultra-light materials with a smooth seam and elastic materials with an elastic seam, by loosely tightening the loop of the top thread of the stitch, without adjusting the normal tension of the threads.

8. Allows you to securely tacking the end of the chain seam by condensation of stitches, reducing the stitch length to 0.5 mm and using a thread chain on the edge of the material.

9. Allows you to sew for a very long time without cleaning the dirt under the needle plate, without fear of disrupting the stitch formation process.

All the above advantages of my new ZARIF double thread chain stitch technology from 2020 not only allow us to develop automation of sewing in the future, but also increases the competitive ability of the thread method of join materials, before non-thread methods of join materials, such as joining materials using welding and glue.

Currently, my new ZARIF double thread chain stitch technology from 2020 is the world leader in bringing together different materials using a single-line thread seam, and it will maintain its global leadership in the future.

My confidence about the future is based on the fact that in the future it is technically impossible to invent a new double thread chain stitch technology that will be able to surpass my new ZARIF double thread chain stitch technology from 2020 in all respects.

For example, it is impossible to bypass in the future my new ZARIF double thread chain stitch technology from 2020 in the simplicity of the mechanical design and in the smoothness of tightening the threads with the help of two rotating two-disc cam thread take-ups.

Because, in the technology of forming any stitch, smooth tightening of threads is considered the most ideal way to tighten threads.

It is also known that the more working units consisting of one part and performing a uniform rotational movement, the simpler the design of the machine.

In this regard, my new ZARIF double thread chain stitch technology from 2020, is the simplest in the world in terms of design, since three working units, such as a rotary looper and two rotary two-disc cam thread take-ups, involved in the formation and tightening of the stitch, consist of a single part and perform a uniform rotational movement.

In addition, in the future, it is impossible to invent a new technology for forming a double thread chain stitch that can even repeat all the above-listed advantages of my new ZARIF double thread chain stitch technology from 2020.

Therefore, I am confident that my new ZARIF double thread chain stitch technology from 2020 will maintain its global leadership in joining different materials using a single-line thread seam in the future, as long as there is a thread method of joining materials.

The thread method of joining materials will serve humanity for a very long time in joining various materials, since non-thread methods of joining materials, such as welding and glue, have their disadvantages over the thread method of joining materials.